Energy adjustment methods for nutritional epidemiology: the effect of categorization

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Abstract: The authors discuss the interpretation of four alternative energy adjustment methods (Residual, Standard, Partition, and Nutrient Density) that have been proposed for the analysis of nutritional epidemiology studies. These methods have so far been compared under circumstances where intake of the nutrient of interest is measured as a continuous variable. Because it is common practice to categorize nutrient intakes in the analysis, the authors investigate the effect of such categorization on the interpretation of results from the four methods with the use of computer simulations and statistical theory. They consider four cases: where the nutrient intake is either divided into quartiles or ordered so as to investigate trend over the quartile groups, combined with using an adjusting variable that is either continuous or categorized. The results show: 1) the Residual, Standard, and Partition methods are no longer equivalent as they are in the continuous case; 2) compared with the Standard method, the Residual method appears to be more powerful for detecting trends in relative odds, is more robust to residual confounding when the adjustment variable is categorized, and provides more meaningful odds ratios; and 3) the Residual and Nutrient Density methods give closely similar results.